# April 2004 NC Weather Review

## Overview

April 2004 across North Carolina was generally drier and slightly warmer than the 30 year climatological average. Across the state in general, April marked the 4th consecutive month of 2004 with below normal precipitation with several reporting stations now reporting 7 consecutive months of below normal precipitation. Precipitation amounts for selected locations across North Carolina are shown below in Figure 1.

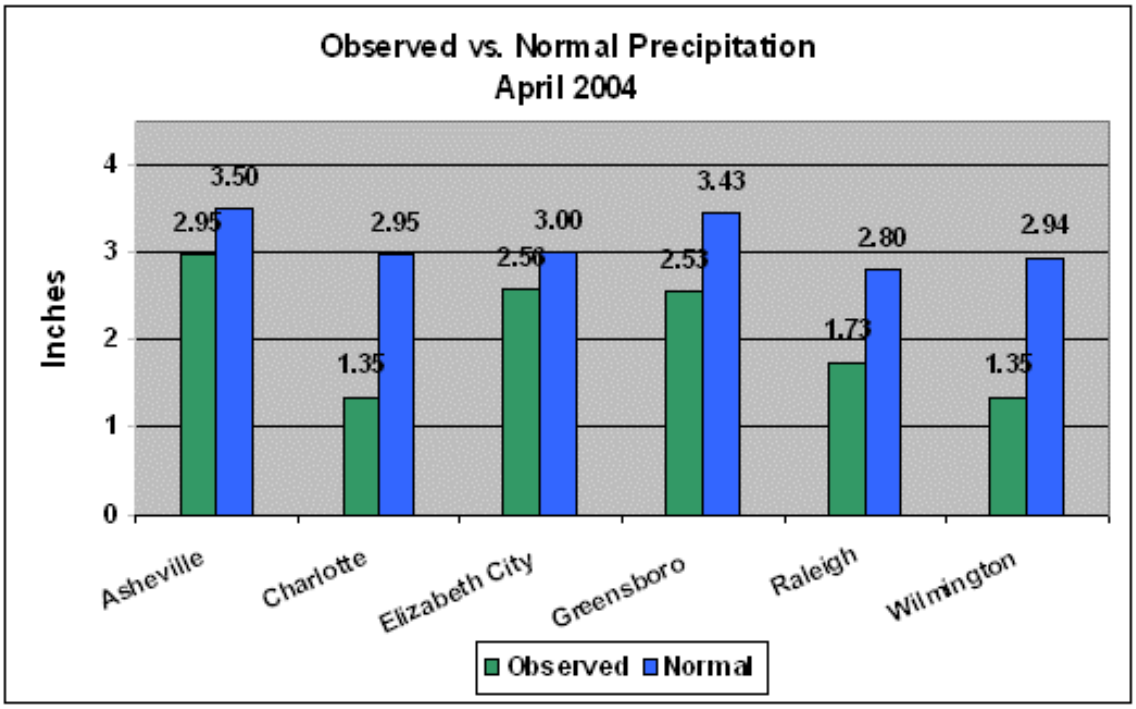


**Figure 1 Monthly precipitation reports and normals for April at selected locations across North Carolina.**

Temperatures across North Carolina during April 2004 averaged slightly warmer than the 30 year climatological average. Most reporting stations averaged about a degree above normal. April was characterized by swings between long periods of cool and very warm temperatures. Daily temperatures at Raleigh-Durham (RDU) and Greensboro (GSO) are highlighted in Figures 2 and 3 on the following page.

The temperature highlight of the month was a 9 day stretch of very warm weather that began in mid April when temperatures averaged 10 to 15 degrees above normal. During this stretch, from April 17 through April 25, Greensboro, Charlotte, and Wilmington recorded 9 consecutive days in the 80s. Raleigh's and Fayetteville's warm stretch ended a few days earlier on the 24th when a "backdoor" cool front dropped temperatures into the 70s. In addition, Asheville, Greensboro, and Hickory did not record a temperature at or below freezing during the entire month.

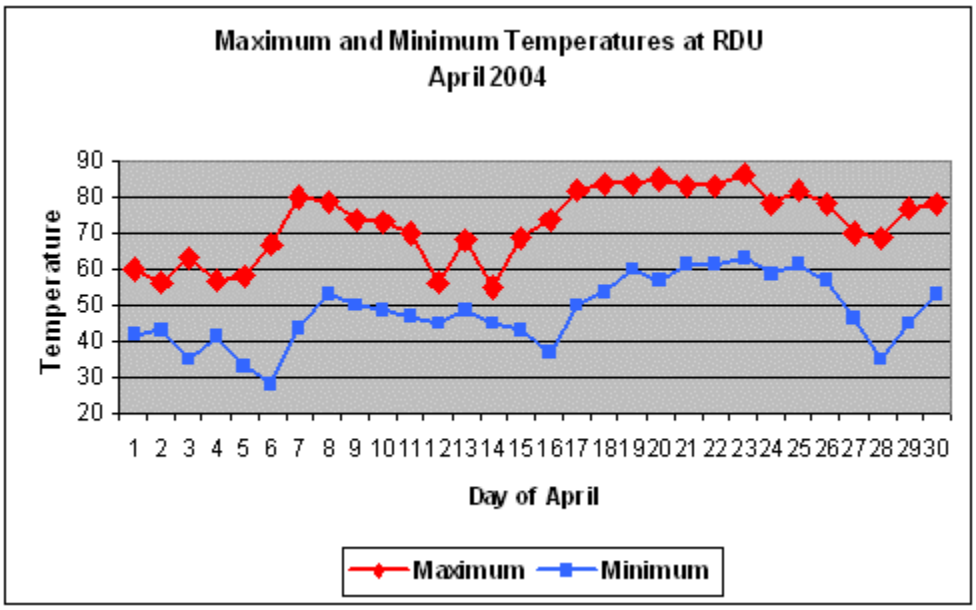


**Figure 2 Daily maximum and minimum temperatures observed in April 2004 at Raleigh-Durham (RDU).**

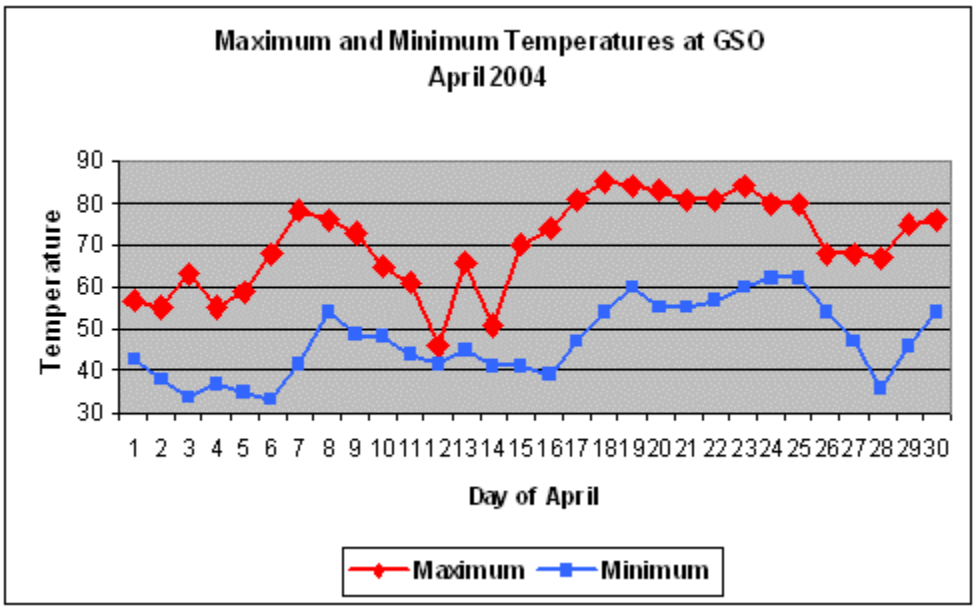


**Figure 3 Daily maximum and minimum temperatures observed in April 2004 at Greensboro (GSO).**

# Details

## Temperatures

April was characterized by swings between long periods of cool and very warm temperatures. The temperatures generally averaged 5 to 10 degrees below normal across the state during the first week of the month. The coldest morning of the month for many locations was on April 6th, when there were a number of sub-freezing temperatures recorded. This was also the date of the last freeze for many inland locations including Charlotte (30 degrees), Raleigh (28 degrees), Lumberton (28 degrees), and Wilmington (31 degrees). Ironically, several coastal sites, including Wilmington, were colder than locations across the Mountains and Piedmonts such as Asheville, Hickory, and Greensboro.

The cold morning resulted from a high pressure system which was building into the state. While light winds across the Mountains kept temperatures from plummeting, the air became calm over the Piedmont and Coastal Plain resulting in ideal radiation cooling conditions. The low temperature of 28 degrees on the morning of April 6 at Raleigh set a record daily minimum temperature. The previous record was 29 degrees recorded in 1992.

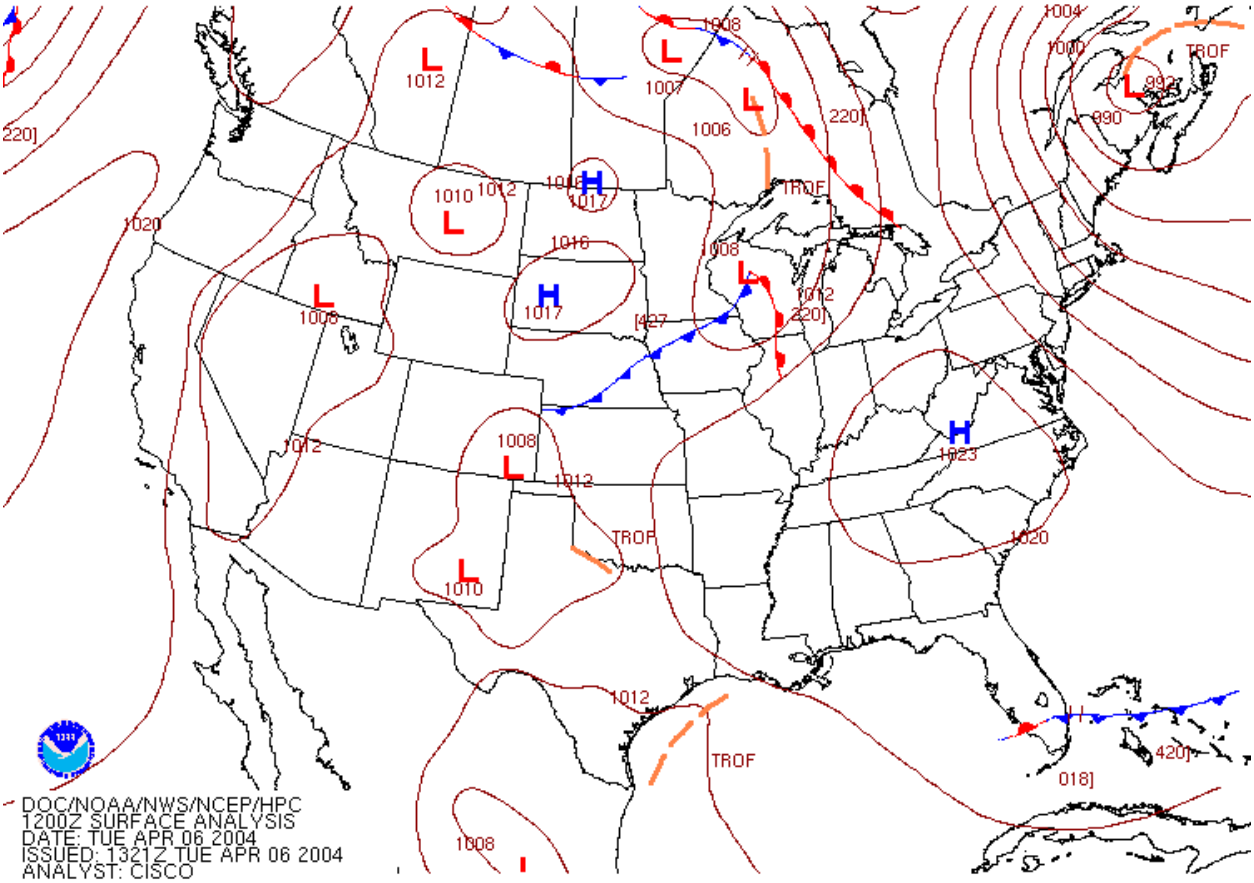


**Figure 4 Analyzed surface map from 12Z (8:00 Am EDT) April 6, 2004**

After the cool and dry period during the first week of the month, much milder conditions arrived on April 7th. Mild and dry conditions persisted for a few days until a "back door" cold front pushed south into the state on the 10th. The frontal system brought cooler conditions and increased cloud cover and moisture. On the 11th and 12th of April, a strong upper level trough and the associated frontal system brought widespread rainfall and cooler temperatures to the state. The rain and showers on the 12th were accompanied by a northeasterly wind that held temperatures in the 40s all day across the western Piedmont, Foothills, and northern Mountains. The cool, wet period persisted through the 14th, when the upper level low pressure system moved off the North Carolina coast.

A strong ridge of high pressure developed over the eastern United States by mid month. Temperatures climbed well into the 80s across locations from the mountains to the coastal plain on the 17th. Many locations across the state recorded 9 consecutive days with temperatures in the 80s from April 17th to the 25th. The warm weather peaked on the 23rd when Fayetteville and Lumberton hit 87 degrees, Raleigh and Charlotte recorded 86 degrees, and Greensboro hit 84. It was even warm across the mountains and foothills where Boone reached 76 and Mount Airy topped out at 80. Despite readings in the mid and upper 80s, no daily maximum temperature records were broken.

## Freeze Data from the Spring of 2004

Figure 5 (below) is a map detailing the date of the last spring freeze for this season (date of last 32 degree temperature reading). The map is based on data from National Weather Service (NWS) observing systems and NWS Cooperative Observer sites. Note that while many areas of the Piedmont, Coastal Plain, and Coastal Area had their last freeze April 6th (shown in light blue) several areas from Asheville to Hickory to Greensboro did not record a freeze after March 23rd or 24th (shown in yellow).

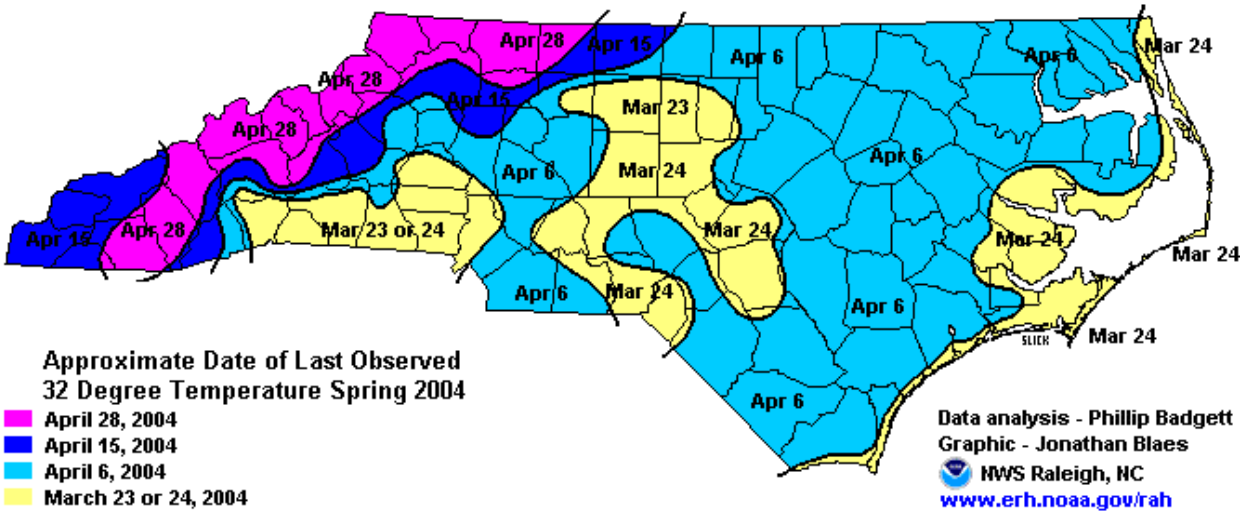


**Figure 5 Analyzed map of the last of occurrence of 32 degree surface temperatures across North Carolina**

A review of the temperatures across North Carolina for April 2004 indicated a fairly unusual occurrence. The reporting stations at Greensboro, Hickory, and Asheville did not record a temperature at or below freezing during the entire month of April. The last occurrence of temperatures at or below 32 degrees occurred back in late March. On average the last occurrence of 32 degrees ranges from around mid April at Greensboro to late April at Asheville

## Precipitation

The first nine days of April were precipitation free. The dry spell was broken on April 10th when a period of unsettled weather began that lasted 5 days. During this period, most locations across North Carolina reported significant rainfall, averaging between 1 and 3 inches. However, the southern Piedmont and the immediate southeast coastal region only received a half inch to an inch of rain (see Figure 6 below). This wet period was followed by a prolonged dry period beginning on the 15th and lasting through the 25th.

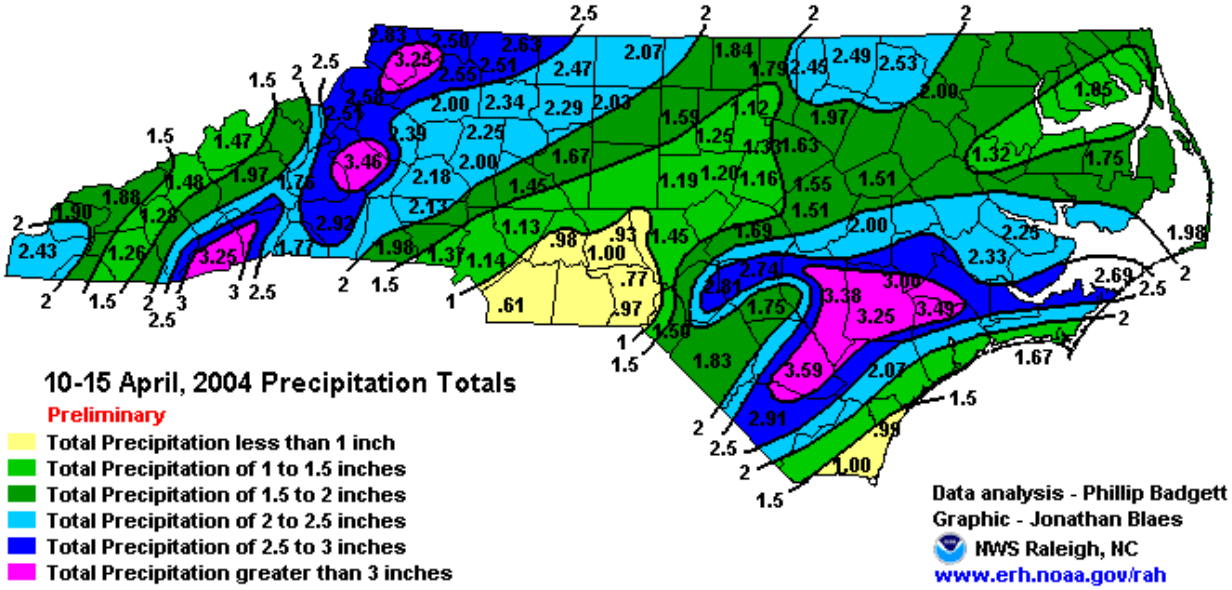


**Figure 6 Precipitation totals from April 10th – 15th 2004 across North Carolina.**

The prolonged dry period ended on April 26th and 27th as a potent upper level trough and associated surface front moved across North Carolina (see Figure 7 on the following page). A widespread band of moderate to heavy rainfall preceded the front as it slowly moved across the state. The showers and thunderstorms moved across western North Carolina during the overnight hours on the 26th and into the early morning hours on the 27th. Rainfall amounts exceeded 1.5 inches across the southwestern Mountains and the eastern slopes of the Blue Ridge. As the front moved into the Piedmont during the morning hours, the rain began to decrease in areal coverage and intensity. Note the minimum rainfall totals over the Piedmont from Charlotte northeast to Roxboro.

Showers and thunderstorms redeveloped and became much more numerous during the early afternoon hours as the area of precipitation moved into the eastern Piedmont and Coastal Plain. Rainfall rates increased, especially east of Rockingham, Raleigh and Warrenton. Several rounds of thunderstorms produced rainfall total in excess of 1.25 inches across Elizabethtown, Clinton, Kenansville, and Elizabeth City.

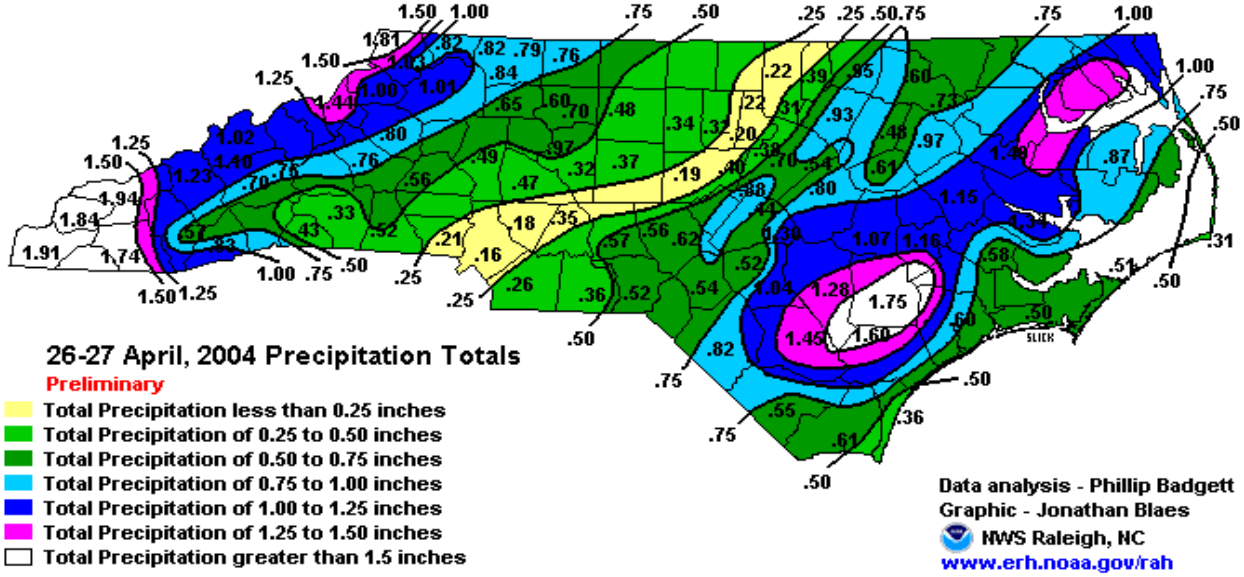


**Figure 7 Precipitation totals from April 26th – 27th 2004 across North Carolina.**

Precipitation amounts at Raleigh and Greensboro have been drier than normal for the most recent 6 month period (November 2003 through April 2004). This is in stark contrast to the previous 6 month period (May through October 2003), when precipitation amounts exceeded normal nearly every month. The trend from very wet to dry became most noticeable during the late summer and fall months of 2003, and was especially pronounced over western North Carolina. Semi-annual and annual precipitation trends at Raleigh and Greensboro are highlighted on the following page in Figure 8 and Figure 9 respectively.

Although precipitation amounts during the past 6 months indicate a significant dry period across North Carolina, the tremendous surplus of precipitation prior to October 2003 offsets the recent dry period. Currently, there is no long term drought or ground water shortage in North Carolina. However, as indicated by the Drought Monitor, most of North Carolina is in the early stages of a short term drought. Extended dryness into summer would increase the threat of a long term drought and would begin to deplete ground water supplies.

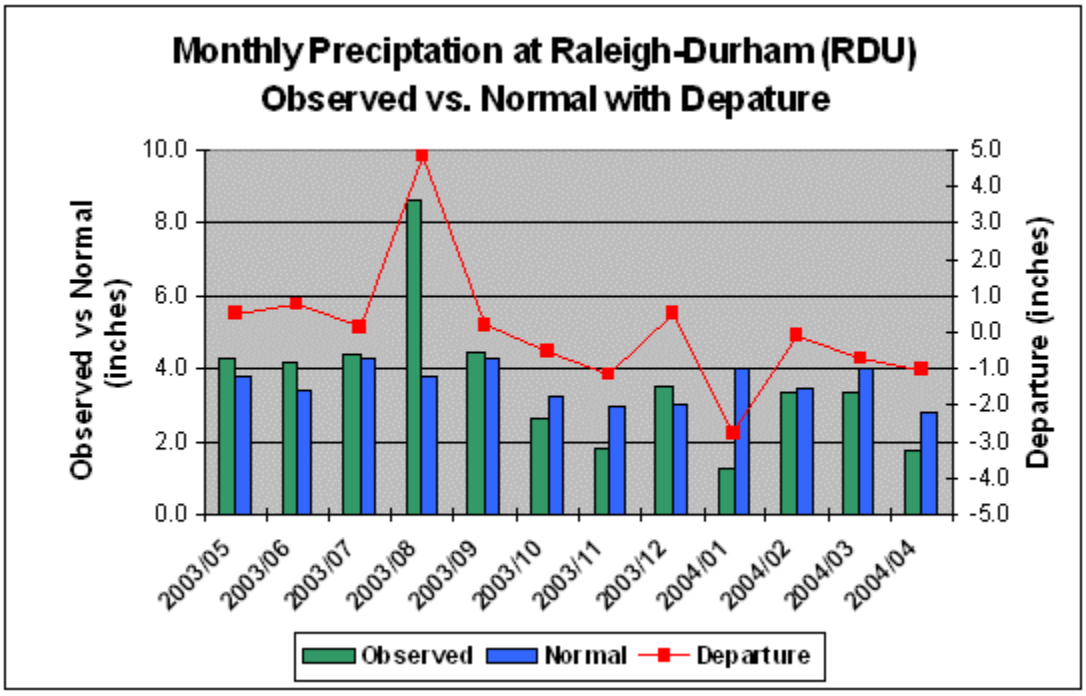


**Figure 8 Bar chart depicting the semi-annual and annual precipitation trends at Raleigh-Durham (RDU).**

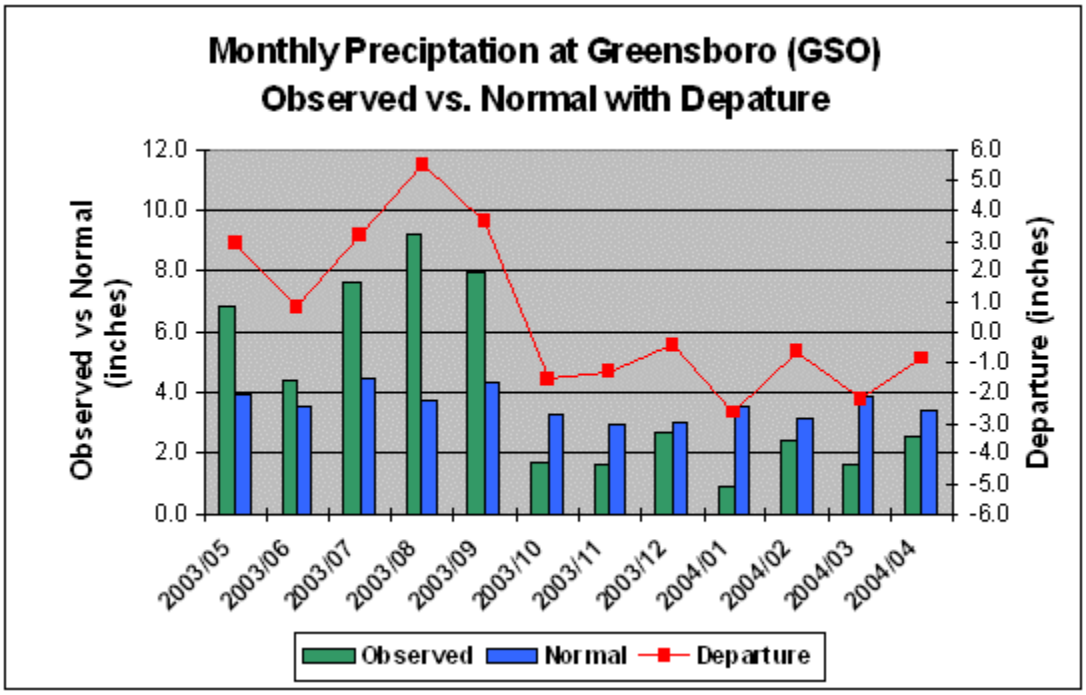


**Figure 9 Bar chart depicting the semi-annual and annual precipitation trends at Greensboro (GSO).**

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**Thanks to**
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